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Planetella lironis – a new record from Greenland

Teodor T. Denchev* & Cvetomir M. Denchev

Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences, 2 Gagarin St., 1113 Sofia, Bulgaria

* Correspondence to: *ttdenchev@gmail.com*

Abstract—*Planetella lironis,* a rare smut fungus known only from Canada, is reported for the first time from Greenland, on *Carex maritima.*

Key words—*Anthracoidea, Anthracoideaceae, Cyperaceae,* taxonomy

Introduction

The monotypic genus *Planetella* was introduced by Savile (1951) to accommodate a *Cintractia*-like (currently, *Anthracoidea*-like) smut fungus on two sedges in *Carex* subg. *Vignea,* forming sori around aborted nuts, as hard bodies covered by a thick peridium, and unusual for *Anthracoidea* spores with a thick-walled, dark equatorial band and two, thin-walled, light polar areas. *Planetella lironis* is known only from Canada on *Carex maritima* Gunnerus [= *C. incurva* Lightf.] from the type locality in Nunavut Province, and also on *C. sabulosa* Turcz. ex Kunth [= *C. leiophylla* Mack.] from Yukon Province (Savile 1951, Vánky 2013). As a closely related genus to *Anthracoidea, Planetella* is included in the *Anthracoideaceae* (Denchev 1997, Vánky 2013).

During an examination of sedge specimens in the Greenlandic herbarium, which is part of the herbarium of University of Copenhagen, Denmark (C), a sorus of *P. lironis* was found in a female flower of a specimen of *Carex maritima.* This specimen represents the first record of *P. lironis* from Greenland.

Materials & methods

A dried specimen from the herbarium of University of Copenhagen (C) was examined under light microscope (LM) and scanning electron microscope (SEM). For LM observations and measurements, spores were mounted in lactoglycerol solution (w : la : gl = 1 : 1 : 2) on glass slides, gently heated to boiling point to rehydrate the spores, and then cooled. The spore measurements are given as min–max (mean ± standard deviation). For SEM, spores were attached to specimen holders by double-sided adhesive tape and coated with platinum in an ion sputter. The surface structure of spores was observed and photographed at 10 kV accelerating voltage using a JEOL JSM 6610-LV scanning electron microscope (Natural History Museum Vienna, Austria). The height of warts was measured in SEM. The type of spore ornamentation, as seen by SEM, is in accordance with Denchev & al. (2013). The description below is based entirely on the specimen examined. The list of shapes of spores is arranged in descending order of frequency.

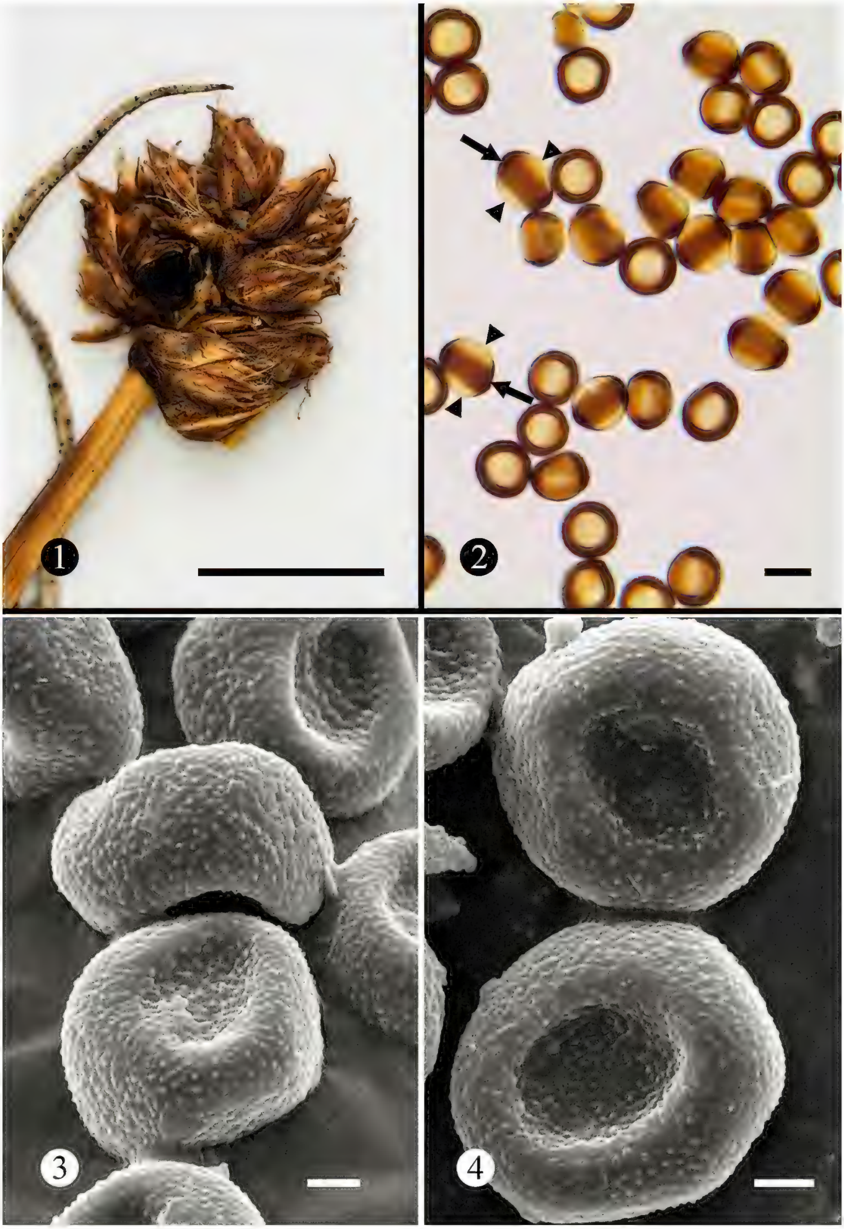
Taxonomy

Planetella lironis Savile, Canad. J. Bot. 29: 327, 1951. FIGS 1–4

SORI in some female flowers, around aborted nuts, as subglobose, hard bodies, ca. 2 mm long, covered by a thick, yellow-brown peridium that later flakes away exposing a black, agglutinated (semi-agglutinated on the surface) spore mass. SPORES slightly flattened, with a thick-walled, medium reddish brown equatorial band and two, thin-walled, light yellow-brown polar areas; in plane view suborbicular, orbicular, broadly elliptical or slightly irregularly rounded, in plane view (10.5–)11–13.5(–14.5) × (9.5–)10–12.5(–13) µm (12.1 ± 0.6 × 11.2 ± 0.6 µm) (n = 100); equatorial band 6.0–8.2 µm wide; in plane view polar areas suborbicular, orbicular, elliptical, broadly elliptical or slightly irregularly rounded, 5.5–7.5(–8.5) µm long; wall unevenly thickened, (1.5–)1.7–2.5(–2.7) µm thick at the equatorial band, 0.5–1.0(–1.2) µm thick at the polar areas, minutely verruculose, spore profile not affected. In SEM spore walls minutely verruculose; warts densely spaced, less than 0.2 µm in height, usually isolated. SPORE GERMINATION unknown.

SPECIMEN EXAMINED—On *Carex maritima:* **GREENLAND**, AVANNAATA, Nuussuaq Peninsula (as 'Nûgssuaq Pen.'), Kûtsiaq, 70°40′N 52°27′W, 19 August 1947, leg. T. Sørensen, Danish Botanical Expedition to West Greenland 1947, no. 9196 (C).

COMMENTS—The new location of *Planetella lironis* extends the eastern and northern limits of this species and its geographic range from Yukon through Nunavut to West Greenland (FIG. 5). Although the range of *P. lironis* seems large, this fungus is known only from single localities. On *Carex maritima,*



Figs 1–4. *Planetella lironis* on *Carex maritima* (herb. C). 1. Habit. 2. Spores in LM (arrows indicate spore equatorial band, arrowheads show spore polar areas). 3, 4. Spores in SEM. Scale bars: 1 = 0.5 cm; 2 = 10 µm; 3, 4 = 2 µm.

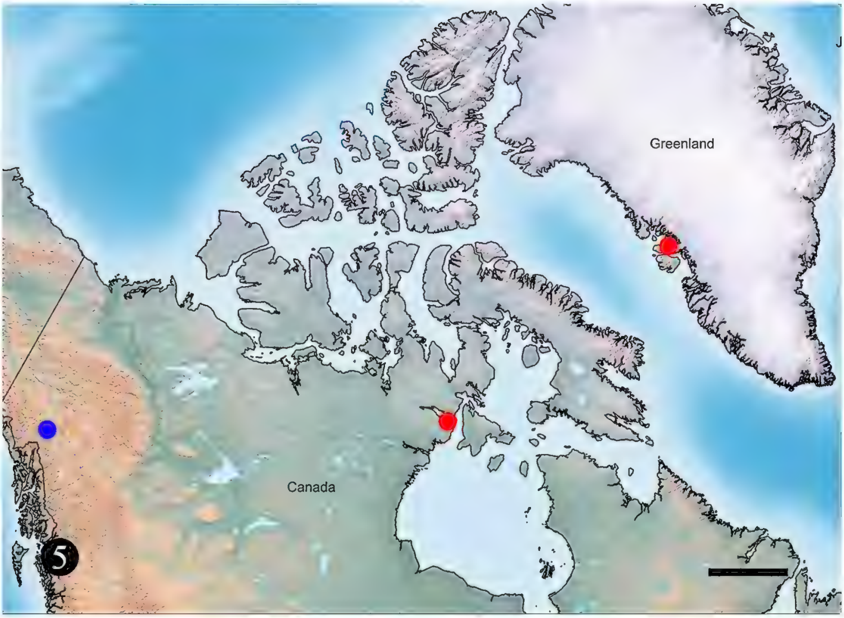


Fig. 5. Geographic distribution of *Planetella lironis* (red circles – on *Carex maritima;* blue circle – on *C. sabulosa*) (generated with SimpleMappr, Shorthouse 2010). Scale bar = 500 km.

P. lironis has been previously recorded only from the type locality (Nunavut, Chesterfield Inlet, 63°21′N 90°42′W; Savile 1951). *Carex maritima* is a widespread species, distributed in Alaska, Canada, Greenland, and North Eurasia (having a circumpolar range in the Northern Hemisphere), and in alpine regions of Europe and Central Asia, as well as in South America (from Ecuador to Argentina) (Egorova 1999, Reznicek 2002, Villaverde & al. 2015, Govaerts 2018). It is noteworthy that *P. lironis* is not reported from North Europe and the alpine regions of Central Europe, which are among the best studied regions in the world for smut fungi, i.e. its absence there is not due to inadequate studies. *Planetella lironis* is a remarkable example of a smut fungus with restricted distribution although its principal host is a widespread plant species.

This statement is also true with regard to occurrence on *Carex sabulosa* which has very restricted distribution in North America, known from only 14 localities in Yukon and one in Alaska (Murray 2002, Baikal Sedge Recovery Team 2012). *Carex sabulosa* is also known from East Siberia, Kazakhstan, and North Mongolia (Egorova 1999). *Planetella lironis* is found at most localities of *C. sabulosa* in Yukon (Baikal Sedge Recovery Team 2012) (Fig. 5) but has never been found in Asia.

In Greenland, the occurrence of a smut fungus on *Carex maritima* was reported by Allescher & Hennings (1897; as *Cintractia caricis* on *Carex incurva,* Uummannaq Island, Uummannaq, as 'Umanak', 28 June 1892). There is no information that this specimen is kept at any mycological collection (see Savile 1951). This record was provided with a very short description, making the identification of the fungal species impossible, although one can assume that it was a specimen of *Anthracoidea* based on the size of spores, given by Allescher & Hennings (1897) as 18–22 µm in diam. Nannfeldt (1979), without seeing this specimen, assigned it to *Anthracoidea* sp. no. 5 on *Carex maritima.* Thus, the specimen of *Planetella lironis* reported here is a first record of this species from Greenland.

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